

**Defense Logistics
Management System
(DLMS)
Introductory Training
Module 4**

Course Structure

Module 1 - Introduction to the DLMS

**Module 2 - Electronic Data Interchange
(EDI) Basics**

**Module 3 - DLMS Implementation
Strategy**

**Module 4 - ASC X12 EDI Definitions and
Concepts**

Module 5 - DLMS EDI

Module 5F - DLMS Financial

Module 5M - DLSS/DLMS Mapping

Module 6 - XML & Emerging Technology

Module Structure

Module 4 - ASC X12 EDI Definitions and Concepts

- **EDI Components and Structure**
 - ✓ **Data Elements**
 - ✓ **Data Segments**
 - ✓ **Segment Loops**
 - ✓ **Transaction Sets**
 - ✓ **Functional Groups**
 - ✓ **Interchange Groups**

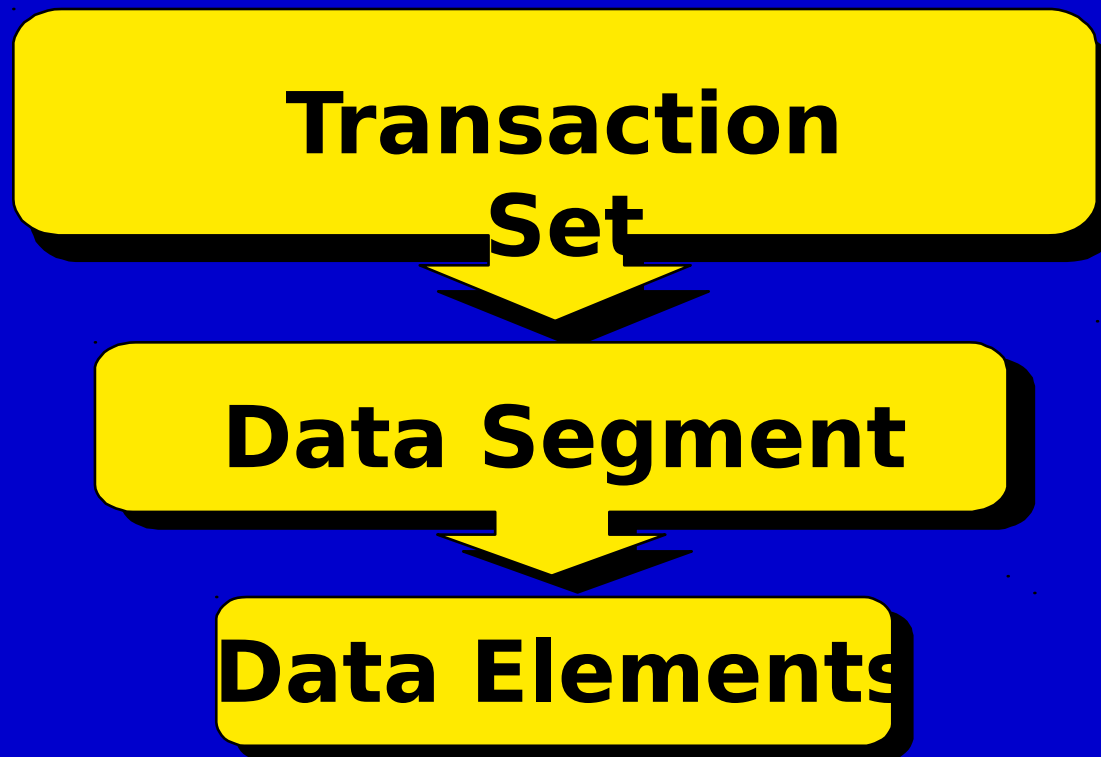
Module 4 Objectives

Students will gain a basic understanding of:

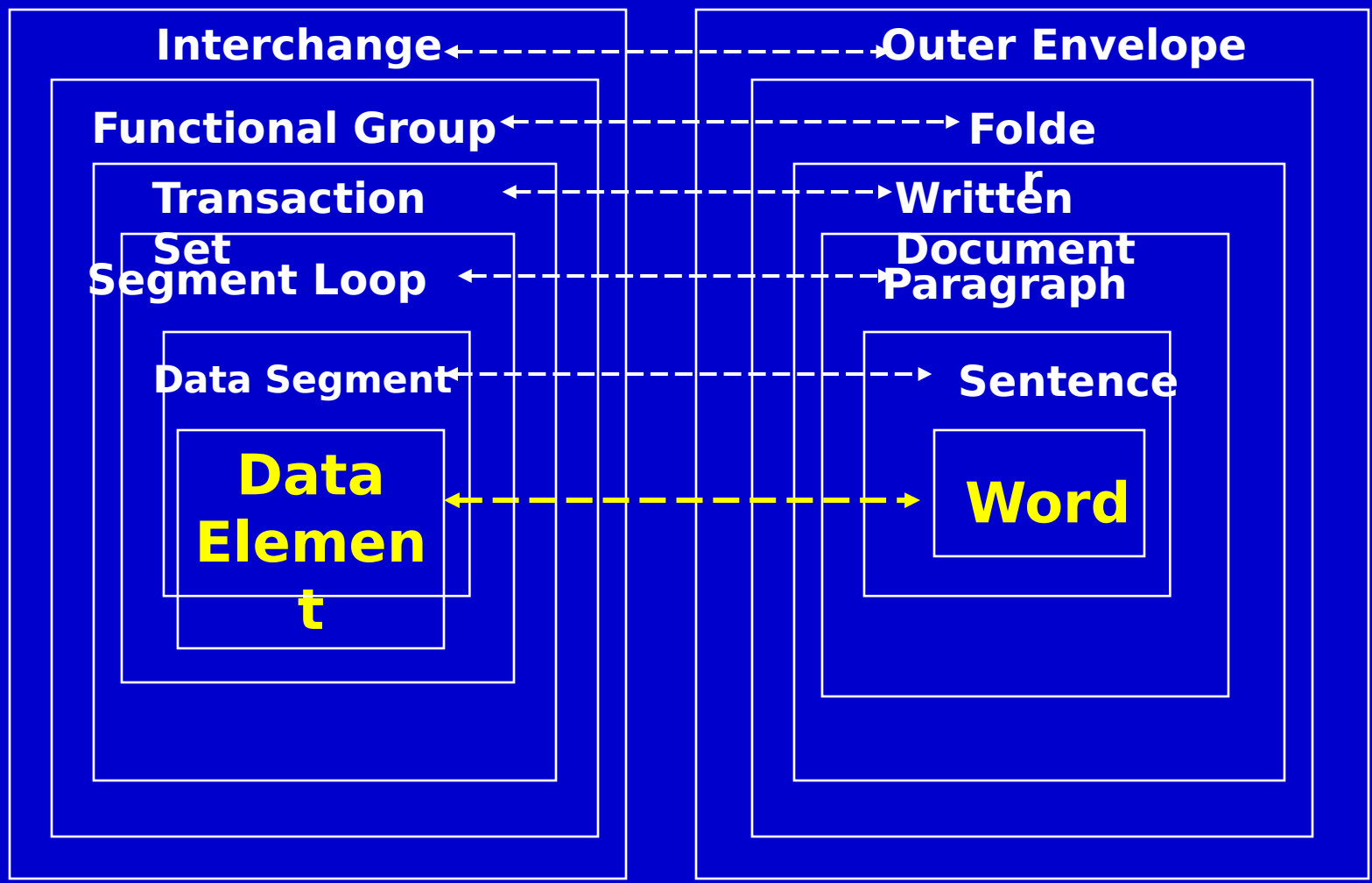
- **The components that form the building blocks of ASC X12 EDI**
- **How the highly structured nature of X12 EDI provides the flexibility and versatility needed to communicate complex functional data content**
- **How to interpret simple raw data expressed in X12 EDI format**

EDI Components

Transaction Set Detail Hierarchy of Relationship



Standard File Structure



Data Elements

- The data element is the smallest named unit of information in the standard
- Each data element is identified by a number
- Data elements can represent a code, a value, or text (such as a description)
- Each data element has both a minimum and maximum length

Data Element Types

There are eight types of data elements:

- AN** - Alphanumeric string including special characters
- B** - Binary (example: 010101101)
- DT** - Date in YYMMDD or CCYYMMDD format based on EDI version being used (DLMS Baseline is 004010)
- FS** - Fixed-length string with trailing spaces if needed
- ID** - Identifier (works with a code list specified by the dictionary)
- Nn** - Numeric (implies the number of decimal points, e.g., N2 would be two decimal positions)
- R** - Decimal Numeric (decimal points must be transmitted if used)
- TM** - Time in HHMMSSDD format

1.56
27
A6B7C
7562



Data Element Size

How Does It Work?

Indicating Min: 6

Max: ~~6~~/6

must be



6 positions

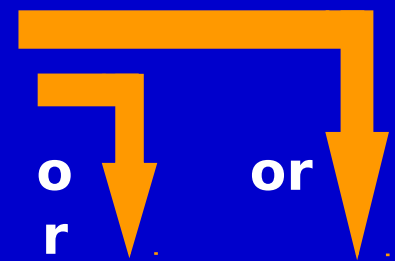
Or
Where

Min: 4 Max: 6

4/6

must be

1234



12345123456

Length
of Field

Data Element Use

- **Data Elements may be:**
 - ✓ M = Mandatory
 - ✓ O = Optional
 - ✓ X = Syntax note applies
 - ✓ Z = Semantic note applies
 - ✓ Combinations may be applicable

Simple and Component Data Elements

- **Data elements are identified as either:**
 - ✓ Simple
 - ✓ Component
 - Used to form composite data structures -- a group of two or more component (simple) data elements linked together to form a single data element
 - The component data elements may be optional, mandatory, or relational

Data Element Dictionary Example

98 Entity Identifier Code

TYPE = ID, MIN = 2, MAX = 3

Code identifying an organizational entity, a physical location, or an individual

SEGMENTS USED IN:

N1,20 segment codes listed

TRANSACTION SETS USED IN:

511,838,850,....145 transaction sets listed

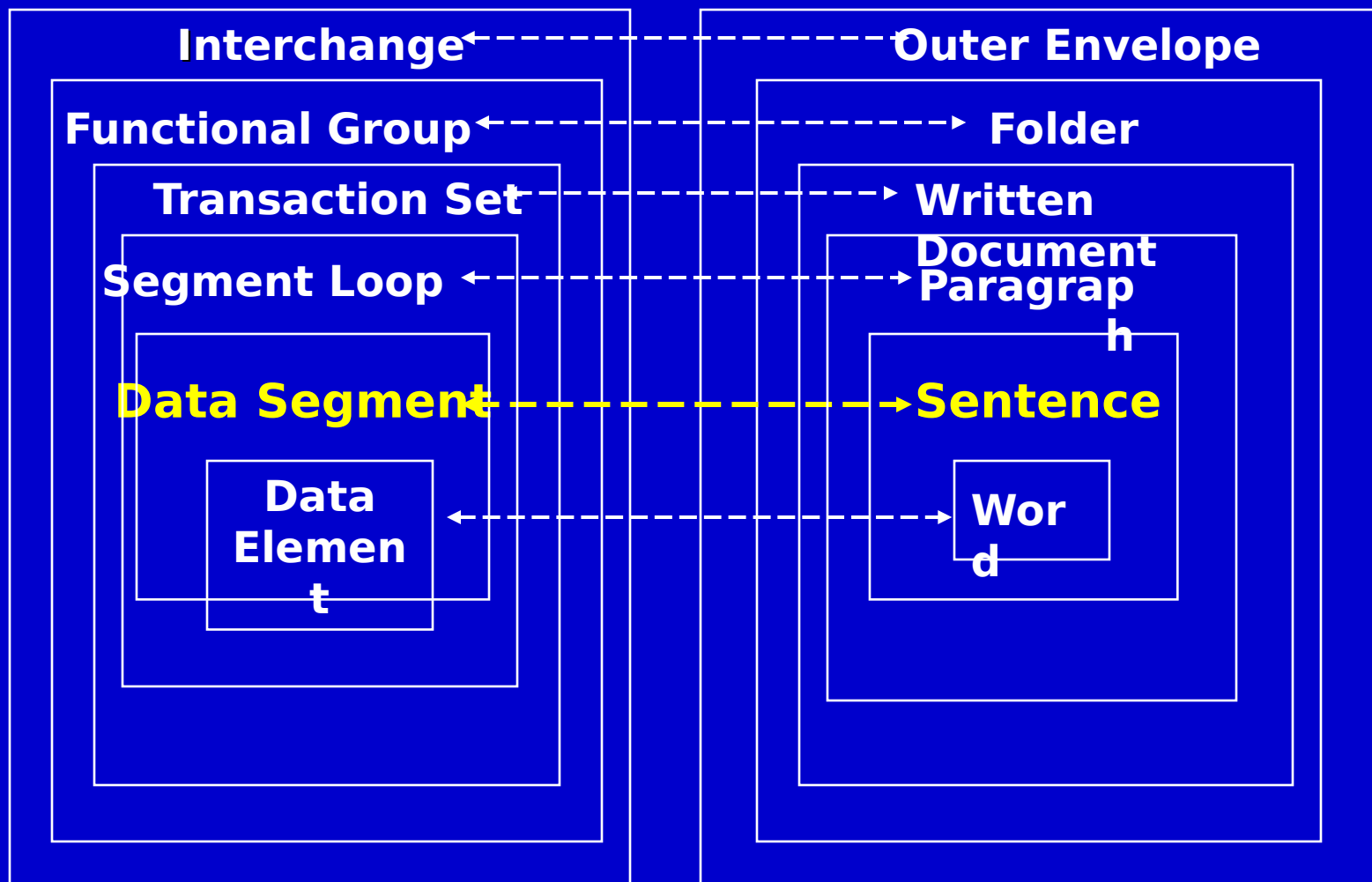
CODE DEFINITIONS & EXPLANATION:

<u>CODE DEFINITIONS AND EXPLANATION</u>	
BS	Bill and Ship To
BT	Bill To
OB	Ordered By
ST	Ship To
Z3	Potential Source of Supply
Z4	Owning Inventory Control Point
Z5	Management Control Activity

- There are more than 1500 Data Elements in the ASC X12 Data Element Dictionary - about 196 of which are used by DLMS

Over 700 codes listed

Standard File Structure



Data Segment

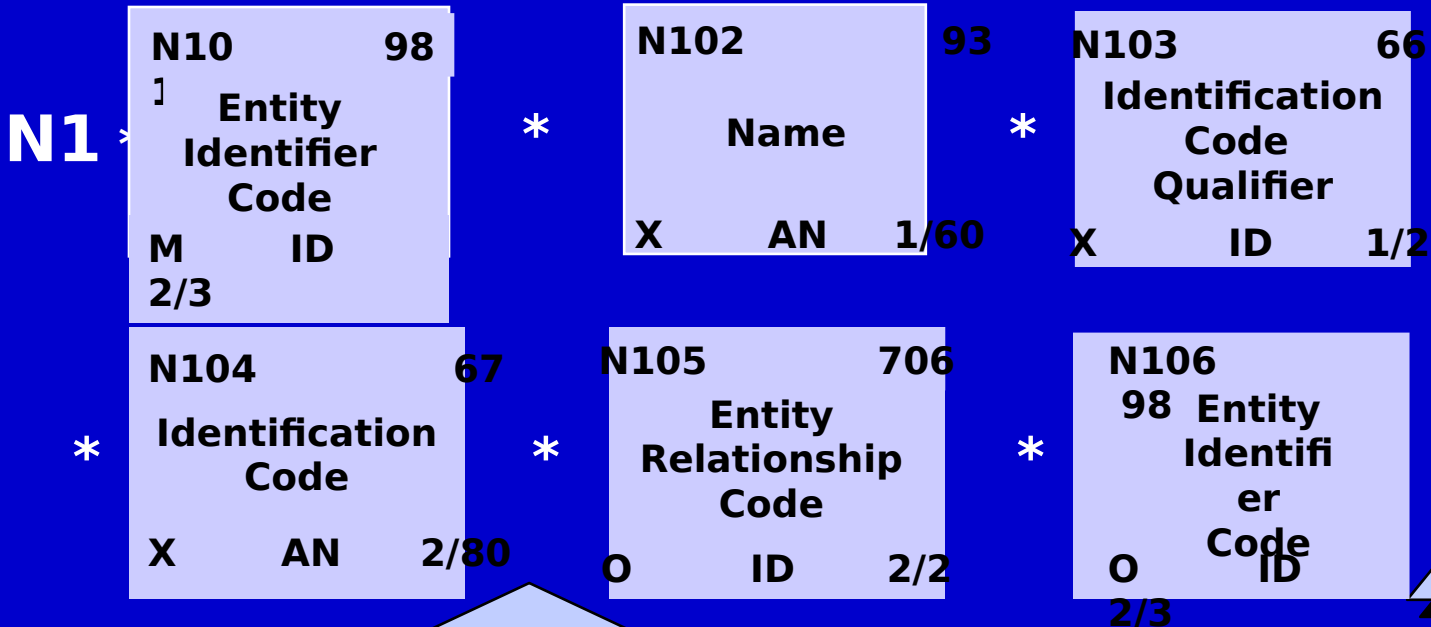
- **The data segment is an intermediate unit of information in a transaction set**
- **Each data segment is composed of:**
 - ✓ A unique segment ID
 - ✓ One or more logically related data elements
- **The data segment is used to convey a grouping of functionally-related user information**

Data Segment Characteristics

- The data is organized in a defined sequence within the segment
- Each data element in the segment is identified by a reference designator composed of the unique segment identifier and the element's sequence number
- Each data element is separated by a data element delimiter character
- A segment delimiter character identifies the end of the segment

Data Segment Diagram

N1 Name

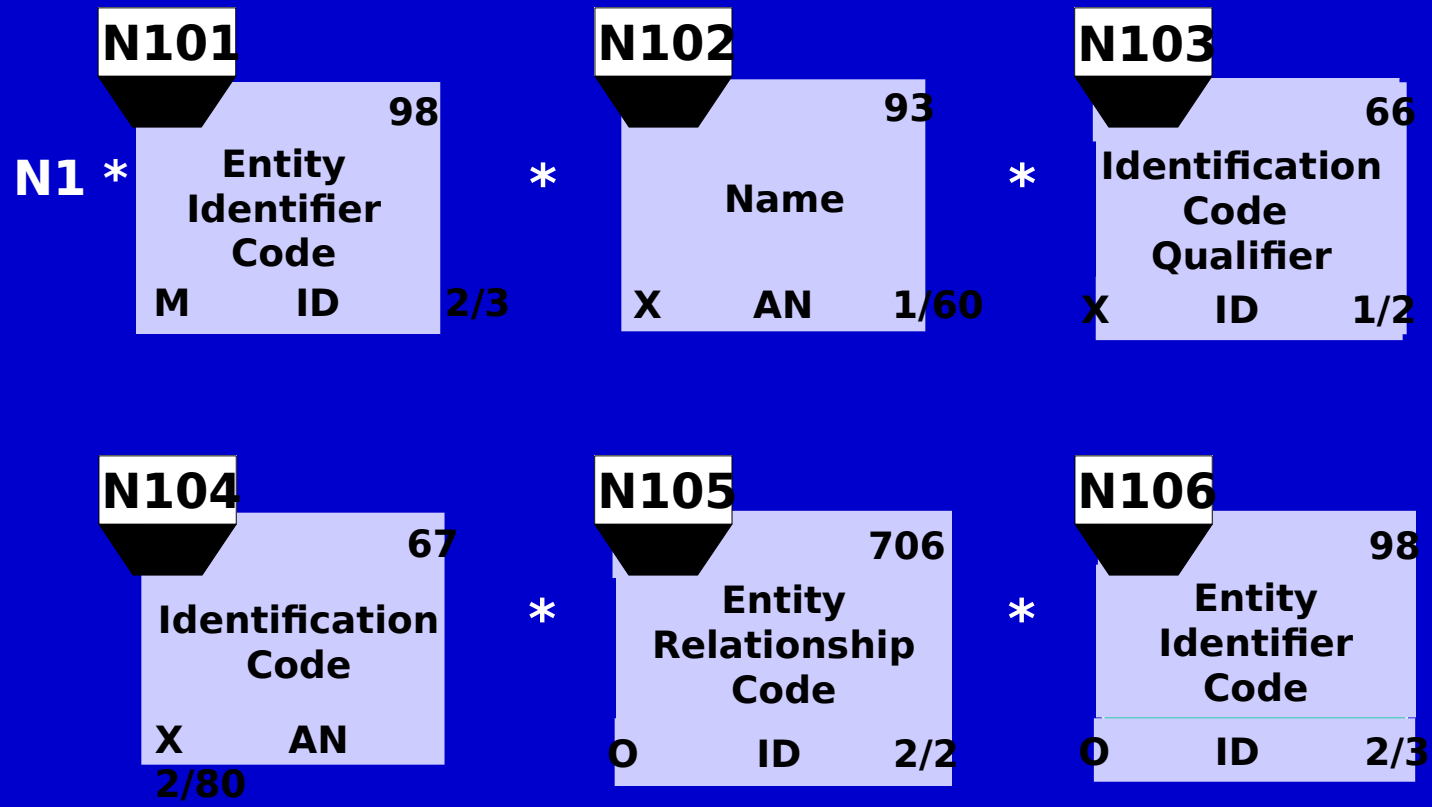


Separator = Element
Delimiter

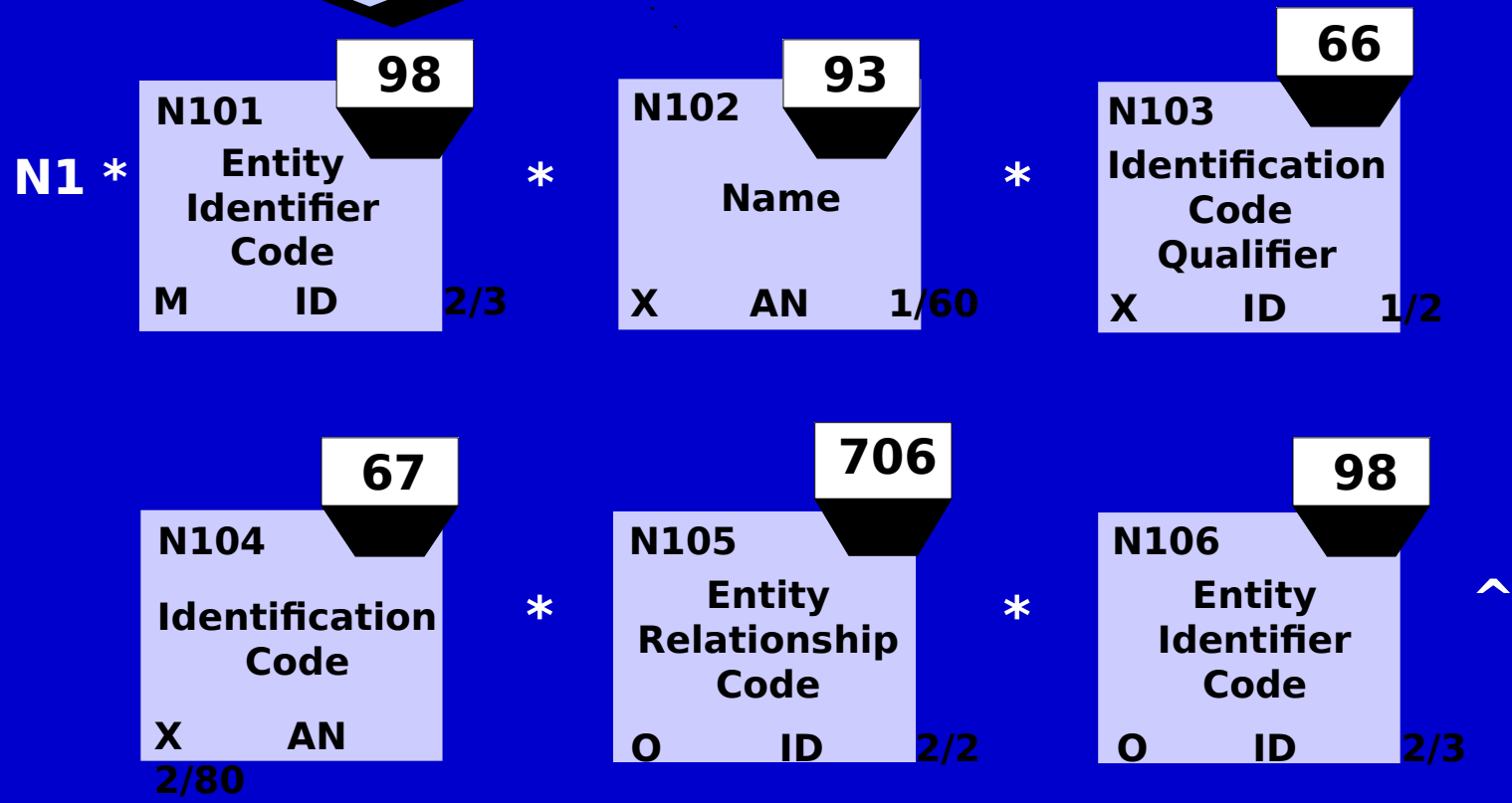
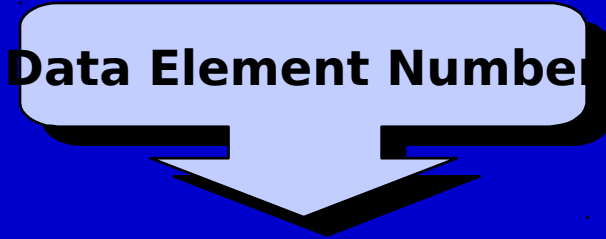
Data Segment
Delimiter

Data Segment Diagram

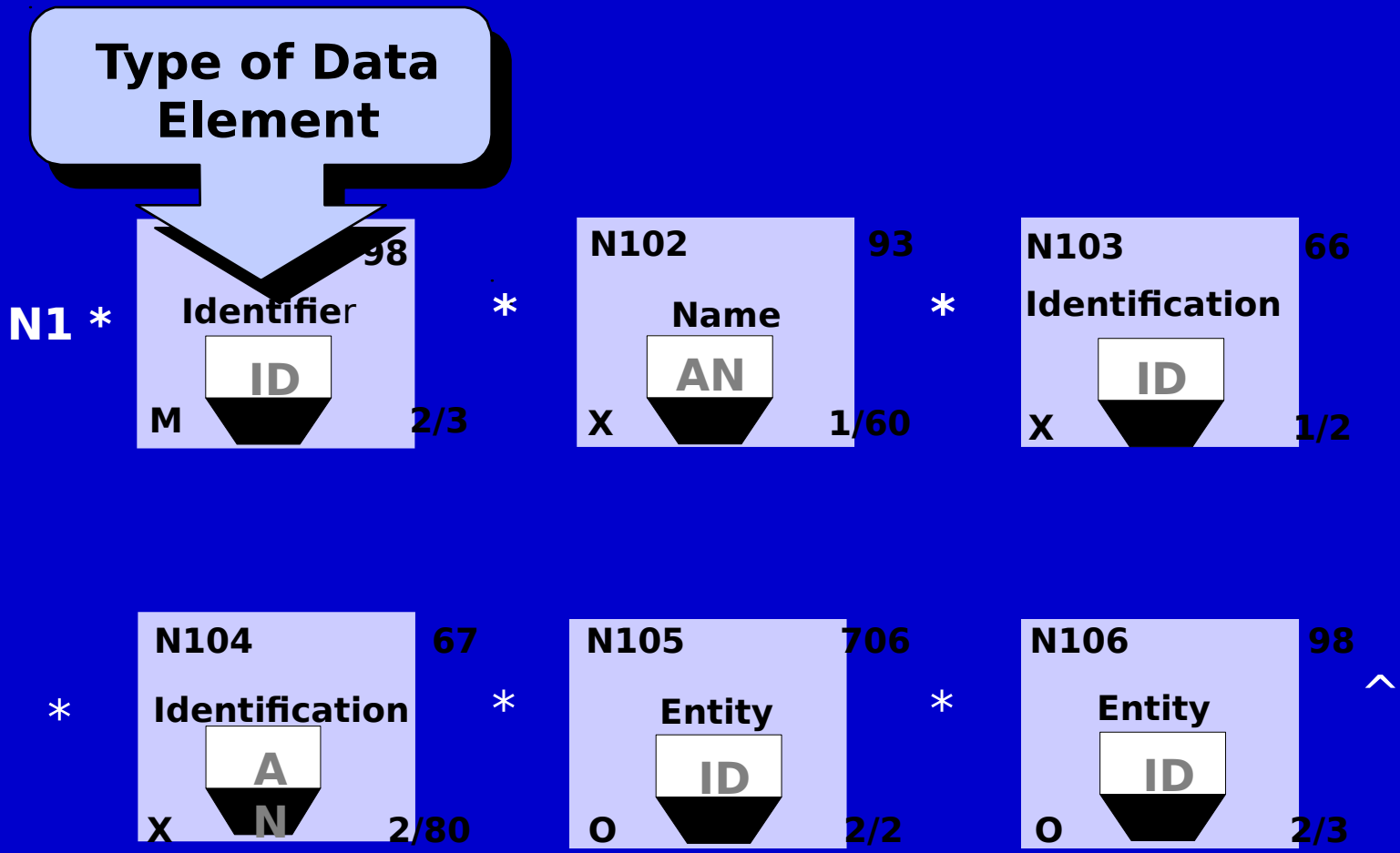
Reference Designator



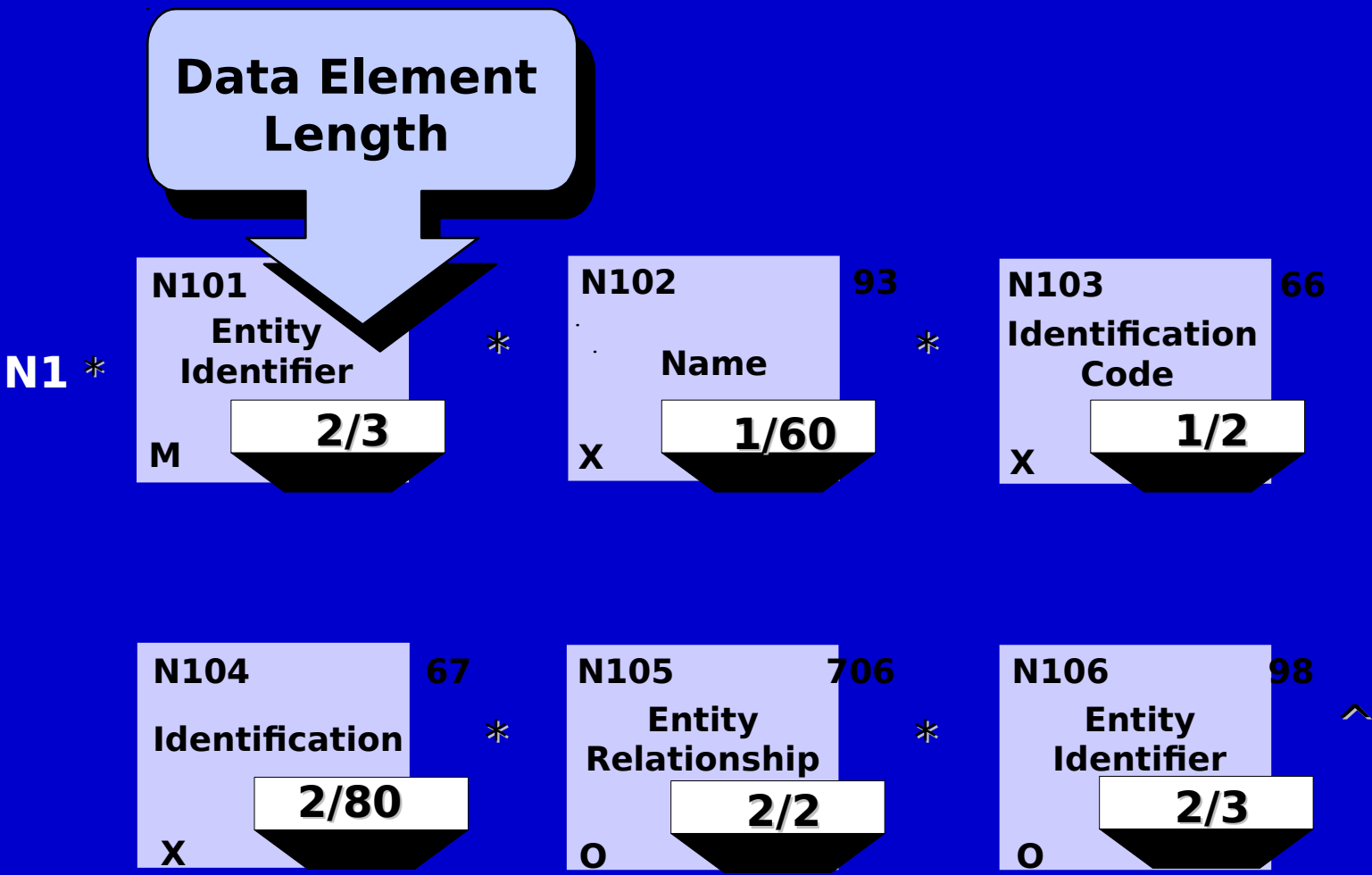
Data Segment Diagram



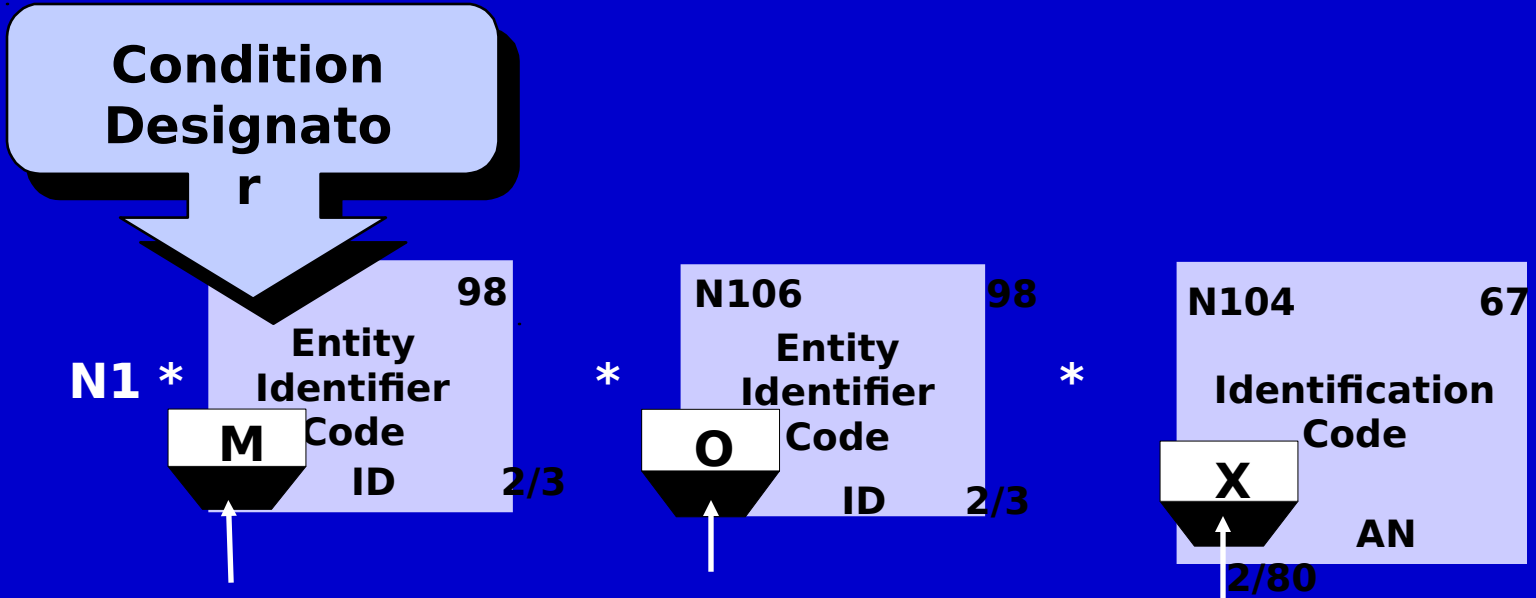
Data Segment Diagram



Data Segment Diagram



Data Segment Use



- M = Mandatory**
- O = Optional**
- X = Syntax note applies**
- Z = Semantic note applies**

Combinations may be applicable 22

Data Segment Diagram

-

Data Dictionary Format

N1 Name

To identify a party by type of organization, name and code

Transaction Sets used in:

104	110	120	128	130	131	135	140	180
511	517							
527	536	561	567	568	810	812	824	830
842								

Ref.	Ele. No.	Name	Attributes
01	98	Entity Identifier Code	M ID 2/3
02	93	Name	X AN
			1/60
03	66	Identification Code Qualifier	X ID
			1/2
04	67	Identification Code	X AN
			2/80
05	706	Entity Reference Code	O ID 2/2
06	98	Entity Identifier Code	O ID 2/3

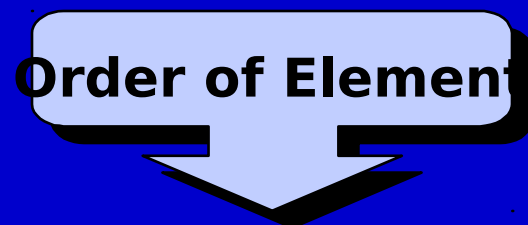
Data Segment Diagram

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05	706	Entity Reference Code	O	ID 2/2
06	98	Entity Identifier Code	O	ID 2/3

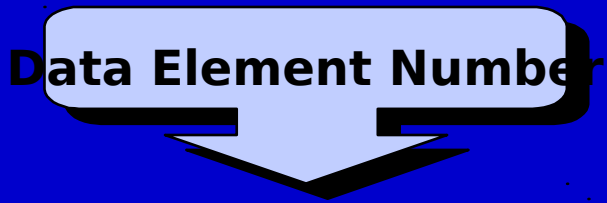
Data Segment Diagram

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Data Segment Diagram

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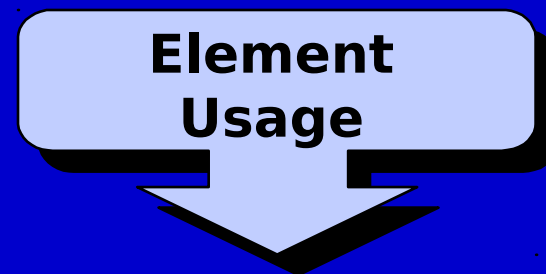
Data Segment Diagram

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104	110	120	128	130	131	135	140	180	511	517
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Ref.	Ele. No.	Name		Attributes
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Data Segment Diagram

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Transaction Sets used in:

104	110	120	128	130	131	135	140	180	511	517
527	536	561	567	568	810	812	824	830	842	

**Format & Size
of Data
Element**

Ref.	Ele. No.	Name	Attributes		
01	98	Entity Identifier Code	M	ID	2/3
02	93	Name	X	AN	1/60
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04	67	Identification Code	X	AN	2/80
05	706	Entity Reference Code	O	ID	2/2
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Data Segment Notes

- **Three types of segment level notes:**
 - ✓ **Syntax:** Define dependencies based on the presence or absence of other data elements in the segment
 - ✓ **Semantic:** Provide additional information about the data element including any dependence based on the data value in another data element in the segment
 - ✓ **Comments:** Clarify the intended use of the segment - comments are not part of the standard

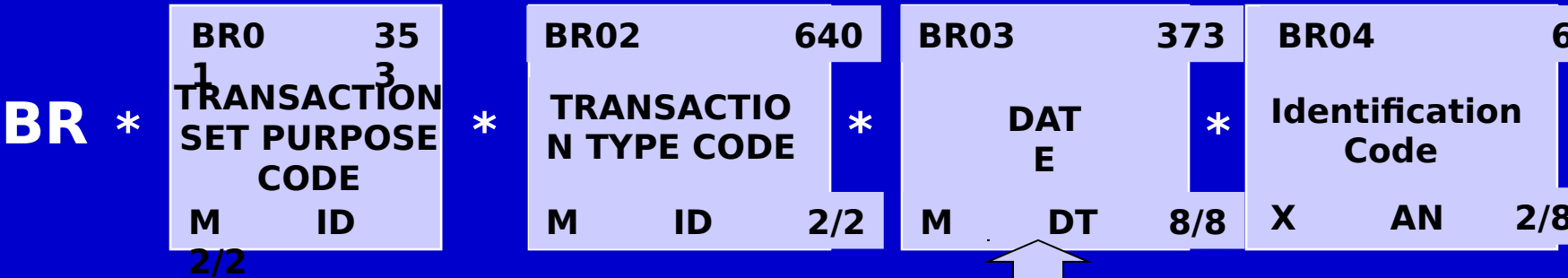
Data Elements Within a Segment

- The same data element may be used in many different segments
- Most data elements are generic with their meaning determined by either the context of the segment they are used in or by the presence of a qualifier data element within the segment

Generic Data Elements

Example 1 - Generic data element 373, Date, used with a semantic note.

BR03	373
DATE	
M	DT 8/8



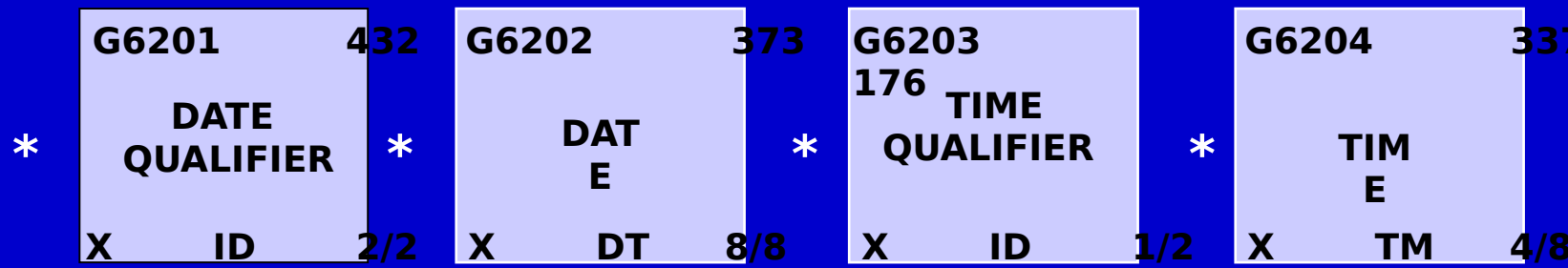
Semantic Note: BR03 is the date of the transaction set preparation

Generic Data Elements

Example 2 - Generic data element 373, Date, used with a qualifying data element.

G6203	373
	DATE
X	DT 8/8

G6
2



Date Qualifier type = ID (codes list available)
 (e.g. "68" = Requested Delivery Date, or
 "BD" = Required By)

Relational Conditions

- **Defines a relationship between two or more data elements in a segment**
- **Expressed in syntax note by letter code followed by the last two digits of the reference designator of the effected data elements (e.g. P0203)**
 - ✓ P (Paired): If any specified data element is present, then all the specified data elements must be present
 - ✓ R (Required): At least one of the specified data elements must be present
 - ✓ E (Exclusive): Not more than one of the specified data elements may be present
 - ✓ C (Conditional): If the first specified data element is present, then all other specified data elements must be present
 - ✓ L (List Conditional): If the first specified data element is present, then at least one of the remaining specified data elements must be present

N1

N1 Name

Segment

To identify a party by type of organization, name and code.

N1

N101	98
Entity Identifier	
M	ID 2/3

N102	93
Name	
X	AN 1/60

N103	66
Identification Code	
L	Qualifier 1/2

*

N104	67
Identification Code	
X	AN 2/80

N105	
Entity Relationship	
O	ID 2/2

N106	9
Entity Identifier Code	
O	ID 2/3

^

Syntax:

1. N102 R0203 - At least one of N102 or N103 is required.
2. N103 P0304 - If either N103 or N104 are present , then the others are required.

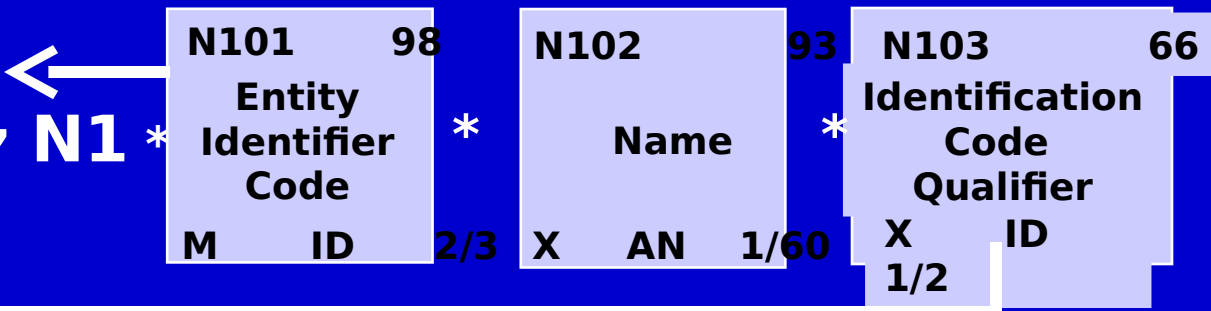
Comments:

1. This segment, used alone, provides the most efficient method of organizational identification. To obtain this efficiency the "ID Code" (N104) must provide a key to the table maintained by the transaction processing party.
2. N105 and N106 further define the type of entity in N101.

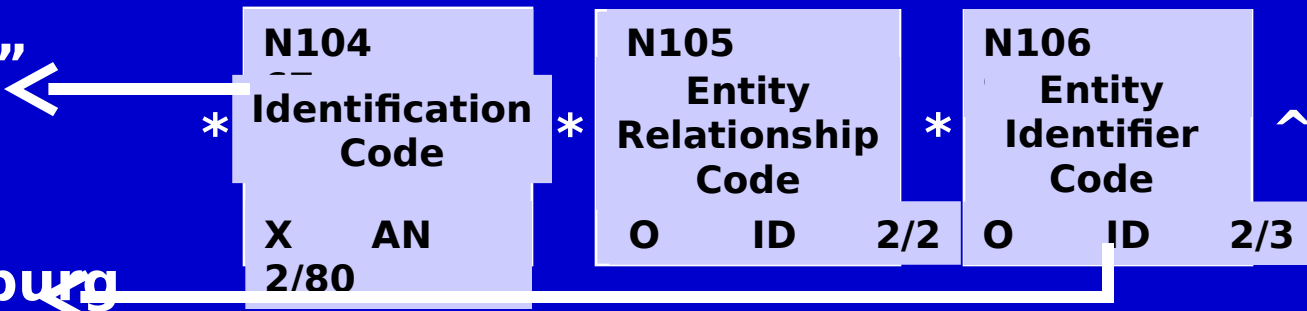
Data Segments

N1*Z4M4*N35**TO^**

Z4 = "Owning Inventory Control Point"



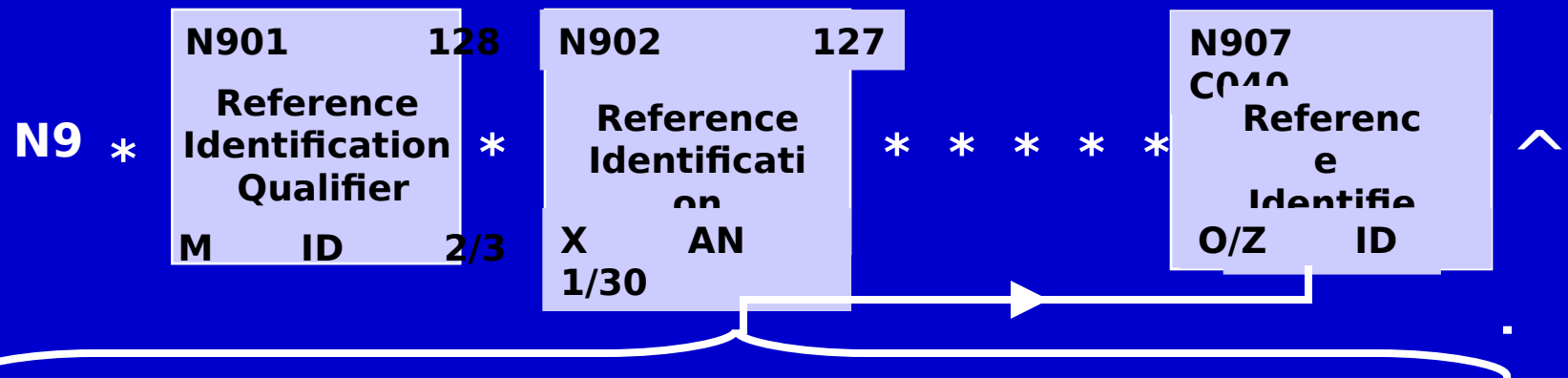
M4 = "Routing Identifier Code (RIC)"



N35 = "Naval ICP Mechanicsburg PA"

Composite Data Structure Within a Segment

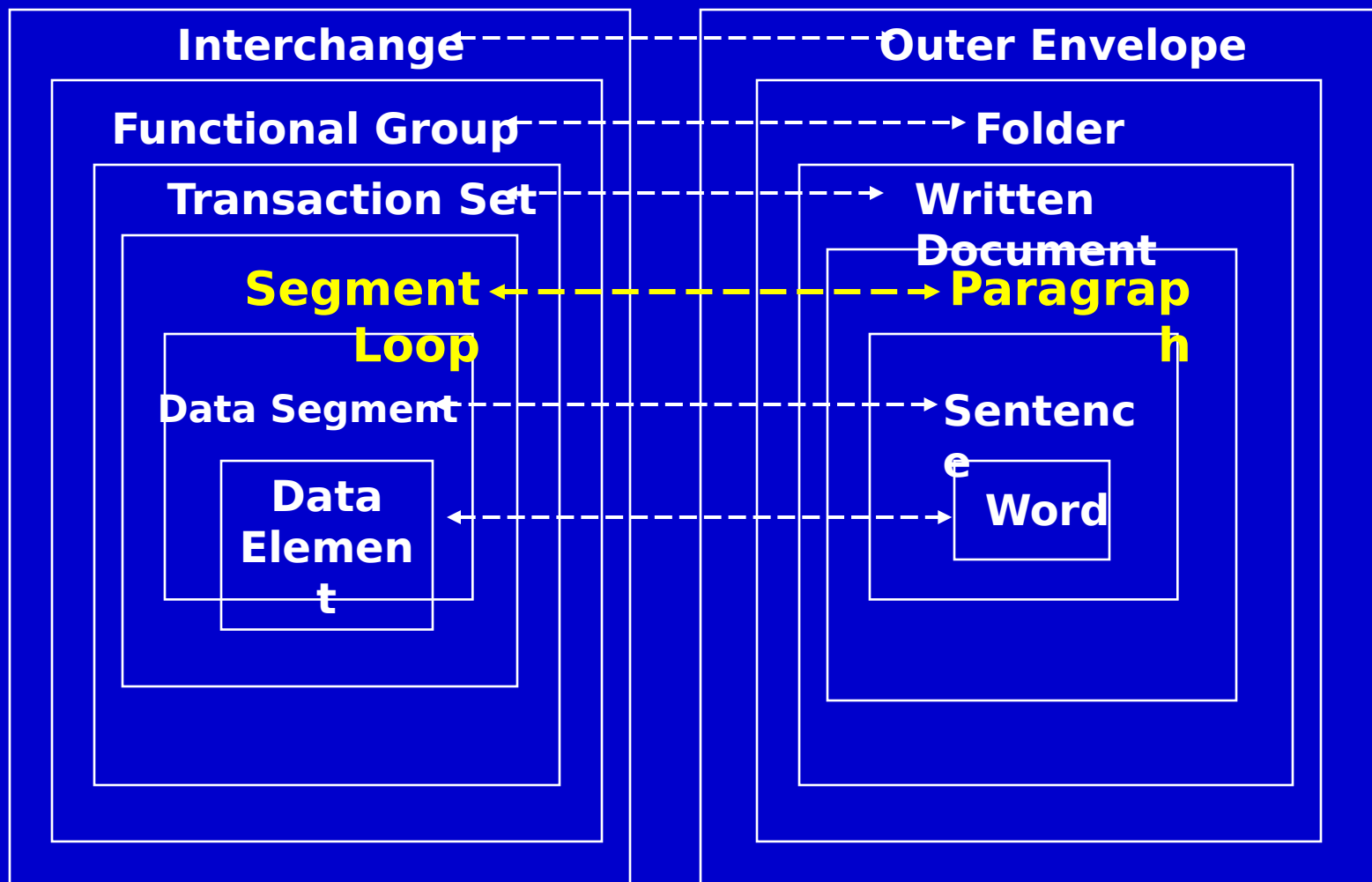
N9*TN*FB205000210001*****W8⊕B^



C04001 128 Reference Identification on M ID 2/3	C04002 127 Reference Identification on M AN 1/30	C04003 127 Reference Identification on X ID 2/3	C04004 127 Reference Identification on X AN 1/30	C04005 128 Reference Identification on X ID 2/3	C04006 127 Reference Identification on X AN 1/30
--	---	--	---	--	---

Example - Composite data element C040, Reference Identifier, used in N9, Reference Identification segment

Standard File Structure



Repeating Data

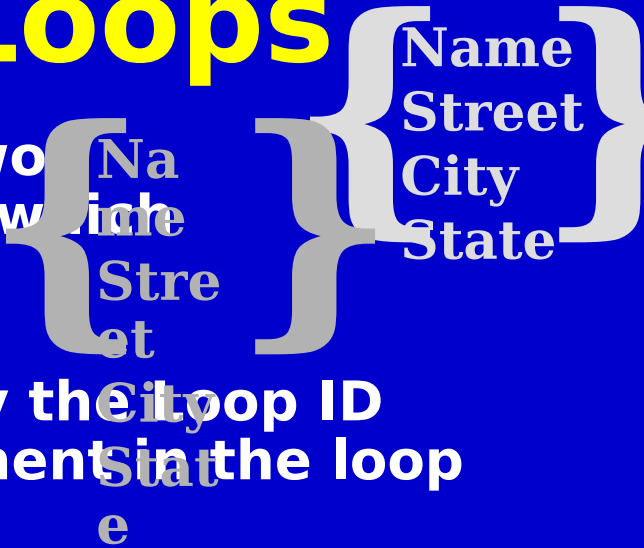
- **Specific sets of data may be used in multiple occurrences to support a functional requirement or to enhance efficiency of communications**
 - ✓ Items requisitioned by a single activity
 - ✓ Dates applicable to a particular process
 - ✓ Addresses – shipper, receiver, bill-to, status recipients
- **ASC X12 transactions provide multiple methods to accomplish this:**
 - ✓ Repetition of a single segment
 - ✓ Loop of a group of segments
 - ✓ Hierarchical loops

Segment Repetition

- **A single segment may sometimes be repeated in multiple occurrences**
- **Each segment within a transaction set has a specified maximum number of occurrences (e.g. 1 or 100) or may be specified as having an unlimited number of occurrences (noted as “>1”) --also referred to as the “max use”**

Data Segment Loops

- By definition, loops are groups of two or more related segments which may be repeated
- The name of the loop is indicated by the loop ID which is named for the first segment in the loop
- Loops have a specified maximum number of occurrences or may be specified as having an unlimited number of occurrences (noted as ">1") -- referred to as the loop repeat
- There is a specified sequence of segments in the loop
- The first segment in the loop has a max use of 1 -- all other segments in the loop may be repeated as specified



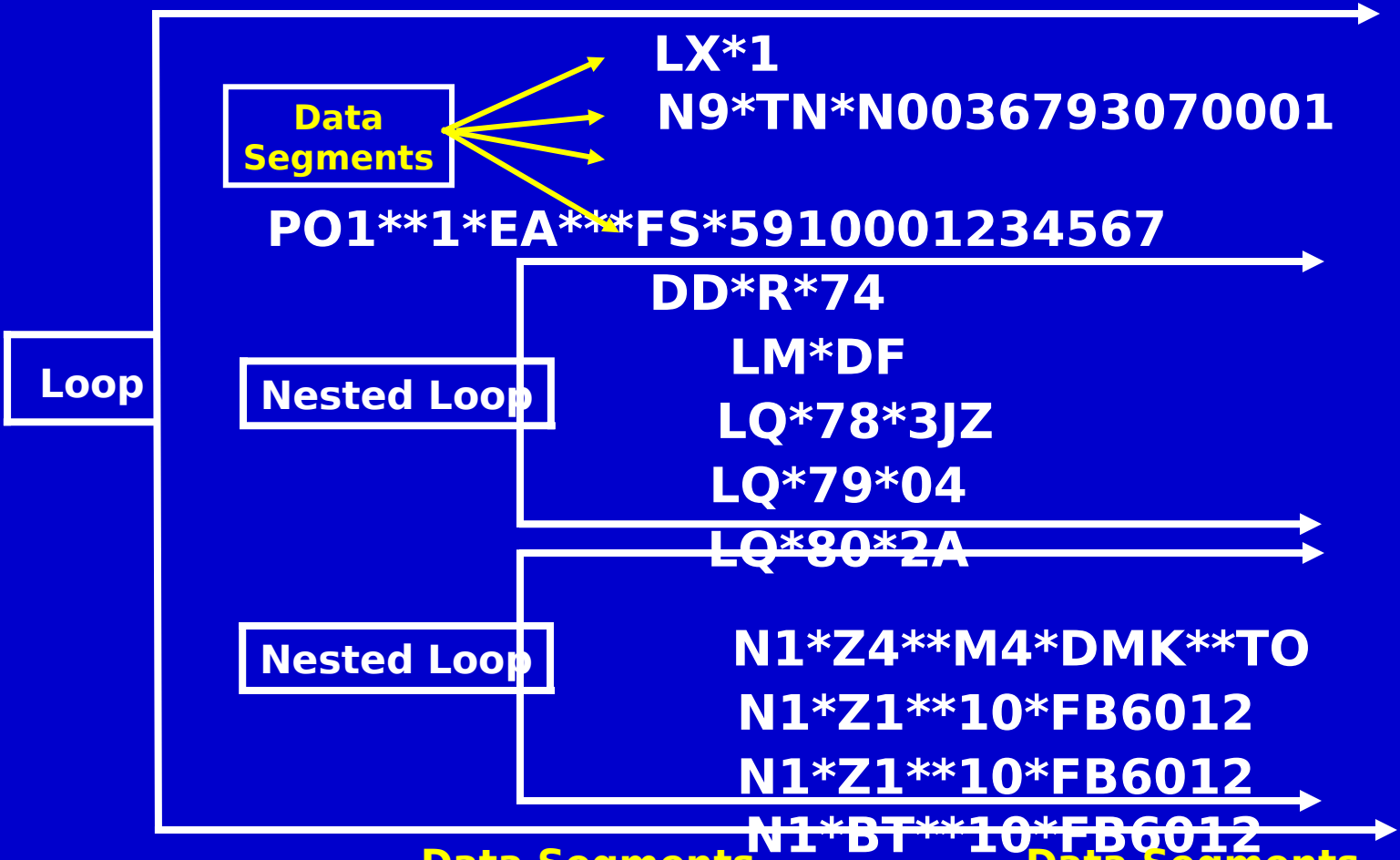
N1 Loop

	<u>Req</u>	<u>Max Use</u>	<u>Repr</u>
<u>Loop ID - N1</u>			
100			
N1 Name	M	1	
N2 Additional Name Information		0	
2			
N3 Address Information		0	2
N4 Geographic Location		0	1
G61 Contact		0	5

Nested Loops

- Loops may have subordinate loops nested within them
- The name of the nested loop is indicated by the Loop ID which is named for the first segment in the subordinate loop
- Nested loops cannot begin with the same first segment as the previous (or outer) loop
- Nesting may occur up to an indefinite number of levels

Loops and Nested Loops



Data Segments

LX = Assigned Number
 N9 = Reference Identification
 PO1 = Baseline Item Data

Data Segments

DD = Demand Detail
 LM = Code Source Information
 LQ = Industry Code

Non-ASC X12 Code Lists

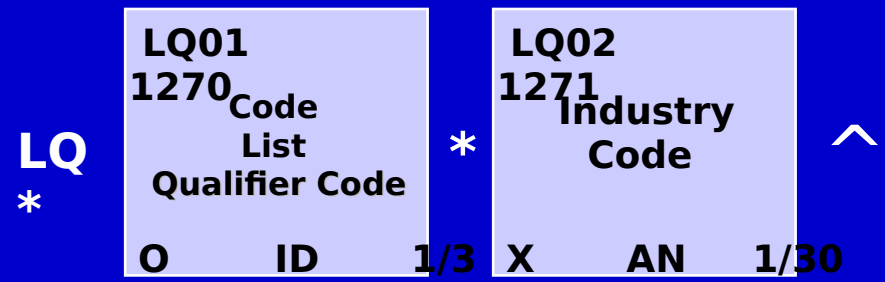
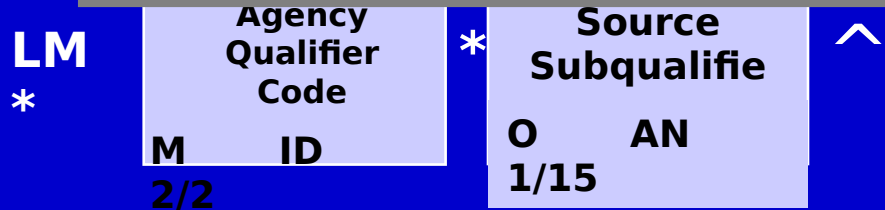
- DoD/Agency/Industry may reference specific code lists maintained outside ASC X12
- Tool to accomplish this provided by the LM Loop

LM Code Source Information

To transmit standard code list identification information

LQ Industry Code

To transmit standard industry codes



COMMENTS: LM02 identifies the applicable industry code list source information

SYNTAX NOTES: C0102 IF LQ is present, then LQ02 is required

LM Loop



LM *	LM01 559 Agency Qualifier Code M ID 2/2	*	LM02 Source Subqualifi O AN 1/6	^	LQ *	LQ01 1270 Code List Qualifier O Code 1/3	*	LQ02 1271 Code X AN 1/30	^
------	---	---	---------------------------------------	---	------	--	---	--------------------------------	---

LM*DF^

LQ*78*3JZ^

LQ*79*04^

CODE	DEFINITION AND EXPLANATION
1270	Code List Qualifier Code
78	Project Code SEE CODE SOURCE 350
79	Priority Code SEE CODE SOURCE 350

350 Defense Logistics Management System Manual

SOURCE: DoD 4000.25-M

AVAILABLE FROM: DLMSO

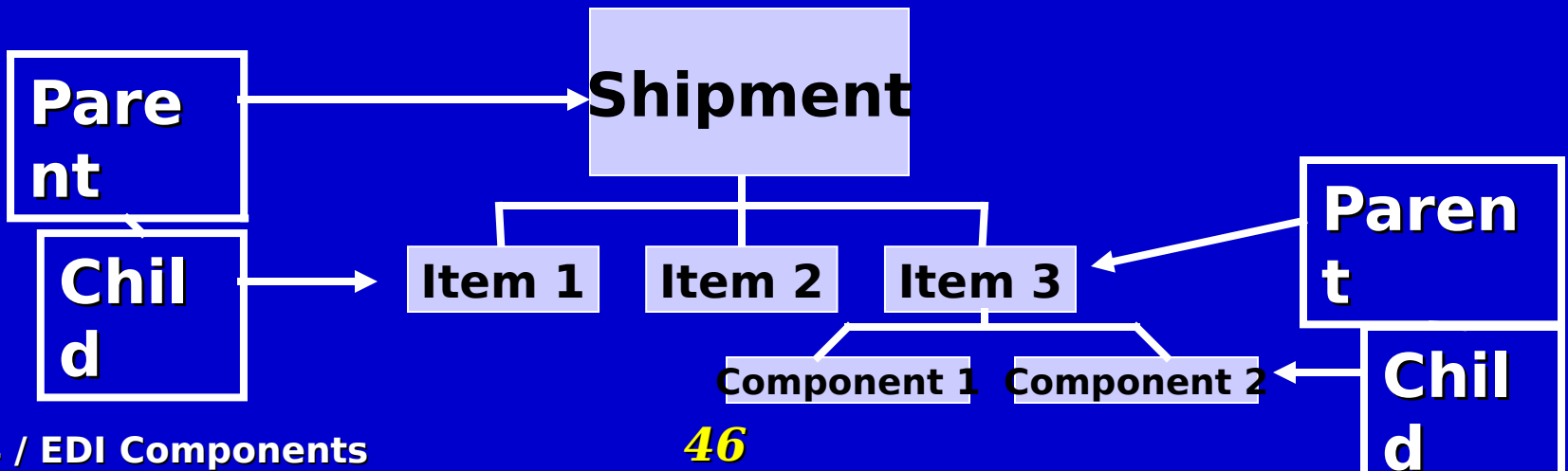
ABSTRACT: This publication provides a comprehensive set of concepts, general guidance and codes related to EDI processing in the DoD logistics system in ASC X12

Hierarchical Level Loops

HL Hierarchical Level

To identify dependencies among, and the content of, hierarchically related groups of data segments.

HL *	HL01 628	HL02 734	HL03 735	HL04 736
	Hierarchical ID Number *	Hierarchical Parent ID Number *	Hierarchical Level Code *	Hierarchical Child Code *
	M AN 1/12	O AN 1/12	M ID 1/2	O ID 1/1



Hierarchical Level Loops

Segment Sequence Within the Transaction

HL

LIN

SN1

TD5

REF

DTM

N1

N2

N3

N4

HL loop 1 = address information (HL Code V)

HL ^1^V ^

N1 (Originating activity address)

HL *2*W ^

LIN (Material identification)

SN1 (Quantity shipped)

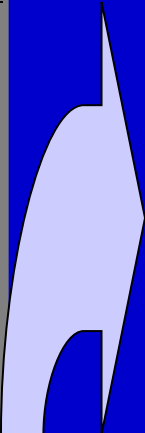
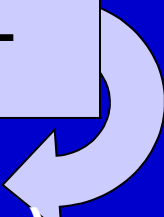
TD5 (Mode of shipment)

REF (Reference numbers)

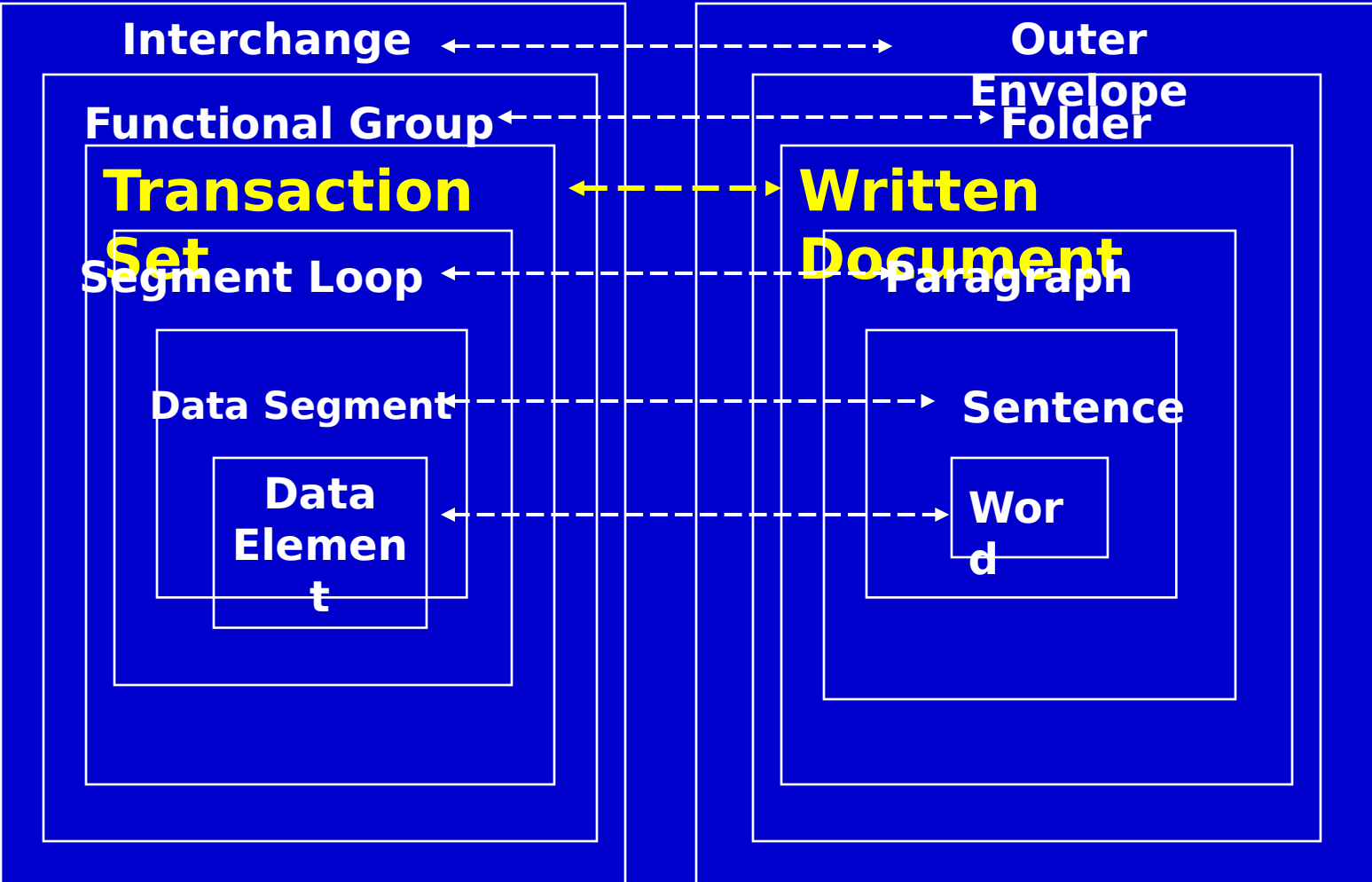
DTM (Date shipped)

N1 (Receiving activity address) ^

HL loop 2 = shipment notice information (HL Code W)



Standard File Structure



Transaction Set

- **A group of data segments in a predefined sequence needed to provide all the data required to define a complete transaction**
- **Uniquely identified by a three-digit number and a name**
- **Begins with an ST segment and ends with an SE segment**
- **Must contain a beginning segment**

Transaction Set - Header and Trailer -

- **ST Segment, Transaction Set Header**
 - ✓ Transaction Set ID (e.g., 511, 527, 810)
 - ✓ Control number (assigned by sender's computer)
 - ✓ Example: ST*511*00000001
- **SE Segment, Transaction Set Trailer**
 - ✓ Segment counts
 - ✓ Same control number used in ST segment
 - ✓ Example: SE*14*00000001

The Beginning Segment

- **A segment at the beginning of each transaction set which defines the purpose, type and action, date, and unique identification**
- **Indicates additional processing that may be required**

BR Beginning Segment for Material Management

To indicate the beginning of a material management transaction and
transmit identifying
numbers and dates

TRANSACTION SETS USED IN:

511 517 527 536

<u>REFELE ID</u>	<u>NAME</u>	<u>ATTRIBUTES</u>
01 353	Transaction Set Purpose Code	M ID 2/2
02 640	Transaction Type Code	M ID 2/2
03 373	Date	M/Z DT 8/8
04 67	Identification Code	X AN 2/80
05 66	Identification Code Qualifier	O ID 1/2
06 306	Action Code	O ID 1/2
07 128	Reference Identification Qualifier	X ID 2/3
08 127	Reference Identification	X AN 1/30
09 337	Time	O/Z TM 4/8
10 128	Reference Identification Qualifier	X ID 2/3
11 127	Reference Identification	X AN 1/30

SYNTAX NOTES

- 05 C0504 - If BR05 is present, then BR04 is required.**
- 07 P0708- If either BR07 or BR08 is present, then the other is required.**
- 10 P1001- If either BR10 or BR11 is present, then the other is required.**

SEMANTIC NOTES

- 03 BR03 is the date of the transaction set preparation.**
- 09 BR09 is the time of the transaction set preparation.**

Transaction Set Table Diagram

- Identifies the purpose of the transaction set
- Identifies all the segments which comprise the transaction set in sequence by position number
- Identifies the structure of the transaction set as heading (table 1) or detail (table 2) or summary (table 3)
- Identifies the loop and nested loop structure
- Indicates which segments are Mandatory or Optional
- Indicates the maximum use of repeating segments

Transaction Set Tables

<u>Pos</u>	<u>Id</u>	
10	ST	Table 1
20	BR	
10	LX	Table 2
20	LM	
30	FA2	
40	SE	

Heading

Detail

<u>Pos</u>	<u>Id</u>	
10	ST	Table 1
20	BR	
10	IT1	Table 2
20	PID	
30	FA2	
10	TDS	Table 3
20	SE	

Heading

Detail

Summary

Transaction Table Diagram

511 Requisition

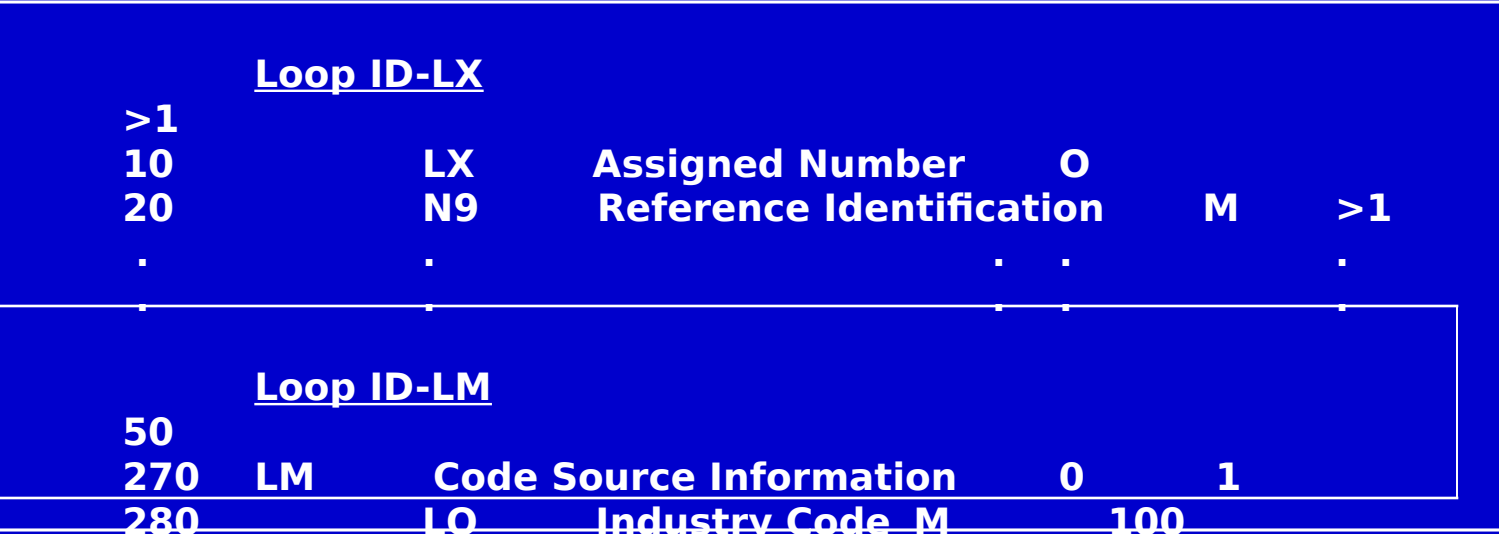
Functional Group: RN

This Draft Standard for Trial Use contains the format and establishes the data contents of the Requisition Transaction Set (511) for use within the context of an Electronic Data interchange (EDI) environment.

Heading:

<u>Pos No</u>	<u>Seg ID</u>	<u>Name</u>	<u>Req Des</u>	<u>Max Use</u>	<u>Loop Repea</u>
010	ST	Transaction Set Header	M	1	
020	BR	Beginning Segment	M	1	
.

Detail:



EDI Document Structure

The DLSS Fixed Format

0102030405060708091011121314151617181920212223242526272829303132333435363738394041424344454647484950515253545556575859606162636465666768697071727374757677787980

RPs Field Legend

- 01-03 Document Identifier
- 04-06 Routing Identifier
- 07 Media and Status
- 08-22 Stock Number
- 23-24 Unit of Issue

- 25-29 Quantity
- 30-43 Document No**
- 44 Demand
- 45-50 Supplementary
- Address
- 51 Signal
- 52-53 Fund
- 54-56 Distribution
- 57-59 Project
- 60-61 Priority
- 62-64 Required Delivery Date
- 65-66 Advice
- 67-69 Blank (Date of Rcpt on Referral/Passing



N0036793070
001

DLMS EDI Format

```

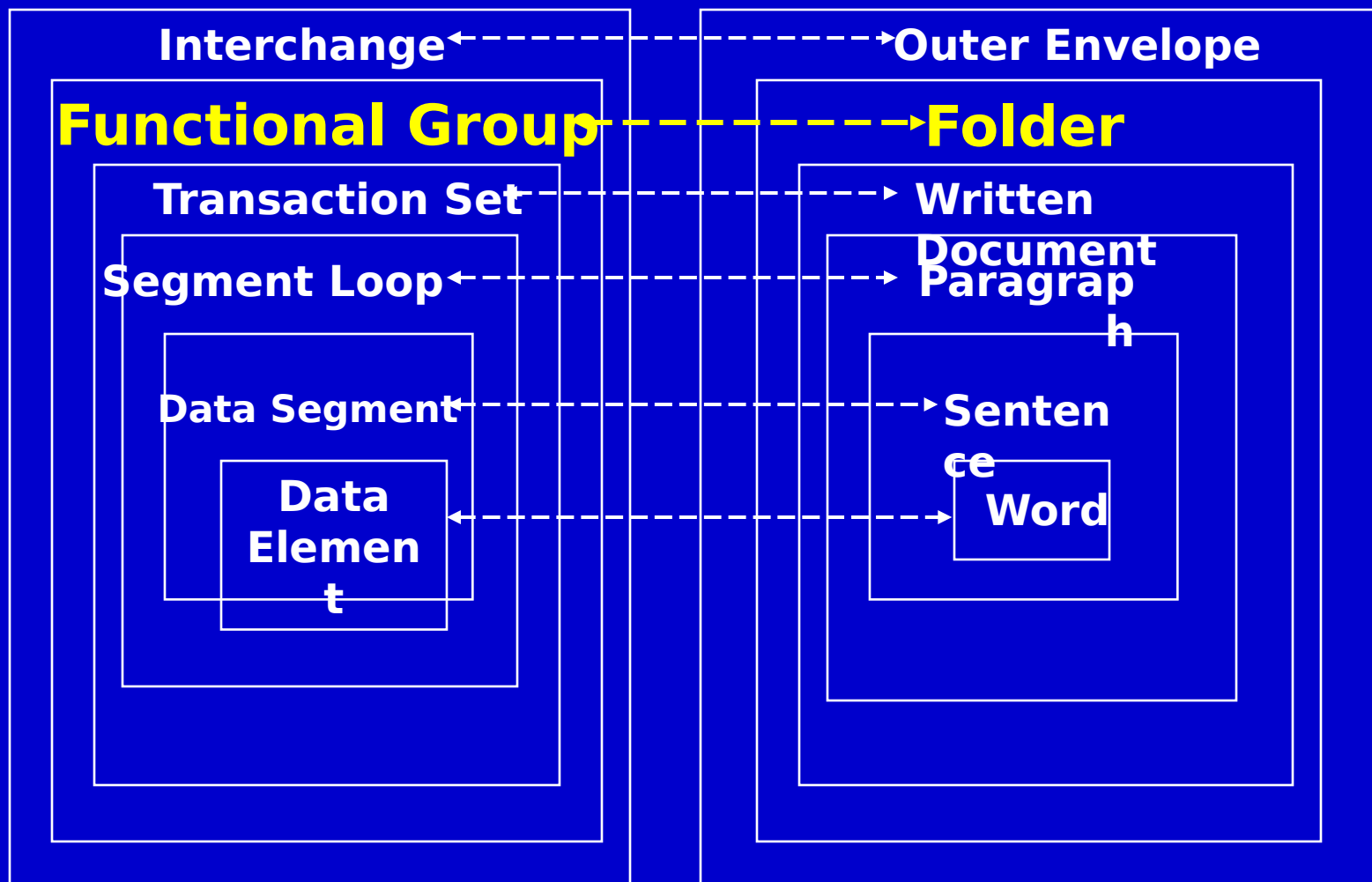
ST*511*00000001^
BR*00*A0*20000729*****13
1708^
N1*QB**10*FB6012**FR^
LX*1^
N9*TN*N0036793070001^
PO1**1*EA***FS*591000123
4567^
DD*R*74^
LM*DF^
LQ*80*2A^
LQ*AL*777^
N1*Z4**M4*DMK**TO^
FA1*DY*D340^
FA2*B5*KZ^
SE*14*00000001^

```


Transaction Set Composition



Standard File Structure



Envelopes

- **Envelopes are specialized segments that enclose groups of documents or transaction sets**
- **Envelopes provide:**
 - ✓ **Verification of proper transmission**
 - ✓ **Time and date stamping of transmission**
 - ✓ **Routing information**
 - ✓ **Version control information**

There are two levels of envelopes....

Functional Group Envelope

- **The inner envelope is used to group like documents or transaction sets within a transmission**
- **This envelope is defined by the Functional Group Header (GS) and Functional Group Trailer (GE) segments**
 - ✓ Contains a functional group ID (e.g., RN (511), MD (527))
 - ✓ Contains transaction set counts and functional group control numbers
 - ✓ Contains a time/date stamp of when the group was generated
 - ✓ Provides format, version, and release specifications of the transactions within the group

Functional Group Envelope

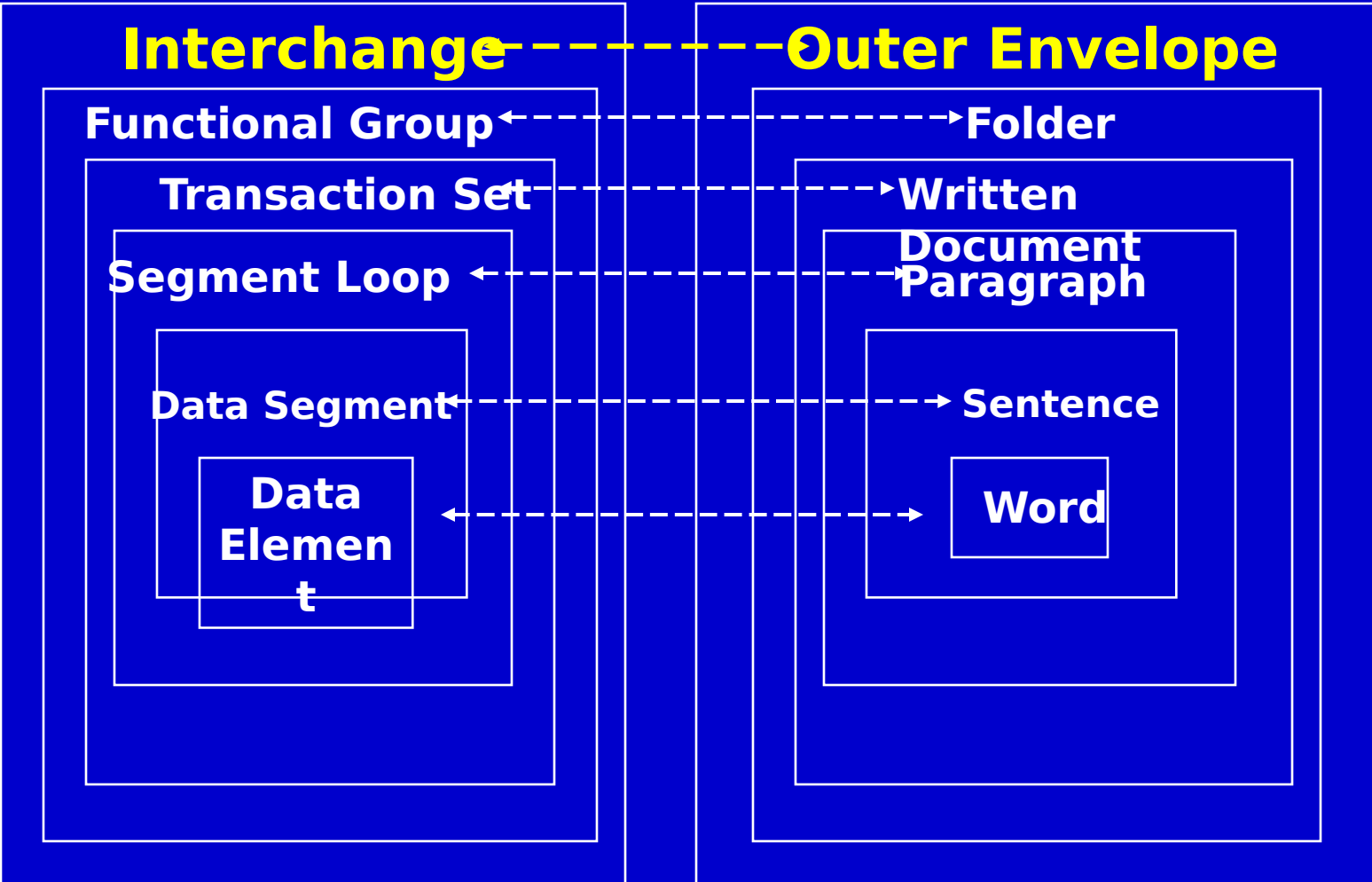
Folder = Functional
Group



=

```
GS*RN*APPSENDERCODE*AP  
PRCVRCODE*20010110*1653  
*000000044*X*004010D511R  
0  
    ST*511*1001  
    .  
    .  
    SE*17*1001  
GE*3*000000044
```

Standard File Structure

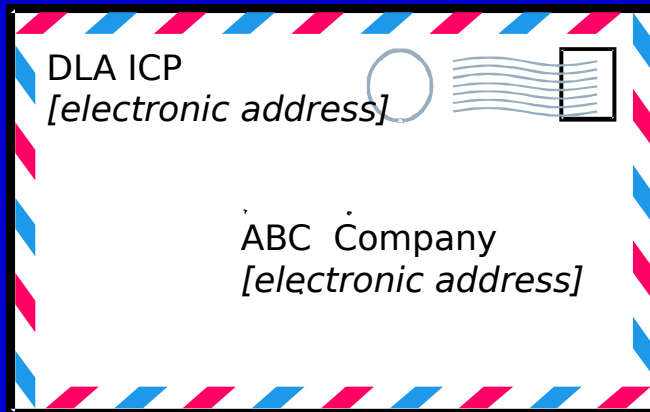


Interchange Envelope

- **The outer envelope is used to group one or more folders or functional groups within a transmission**
- **This envelope is defined by the Interchange Control Header (ISA) and Interchange Control Trailer (IEA) segments**
 - ✓ Contains the structured mailbox address of the sender and the receiver
 - ✓ Contains control numbers and counts of the different types of folders or functional groups inside
 - ✓ Contains a time/date stamp
 - ✓ Specifies the format and version of the interchange envelopes
 - ✓ Specifies what characters are being used for data element delimiters (separators) and segment terminators

Interchange Envelope

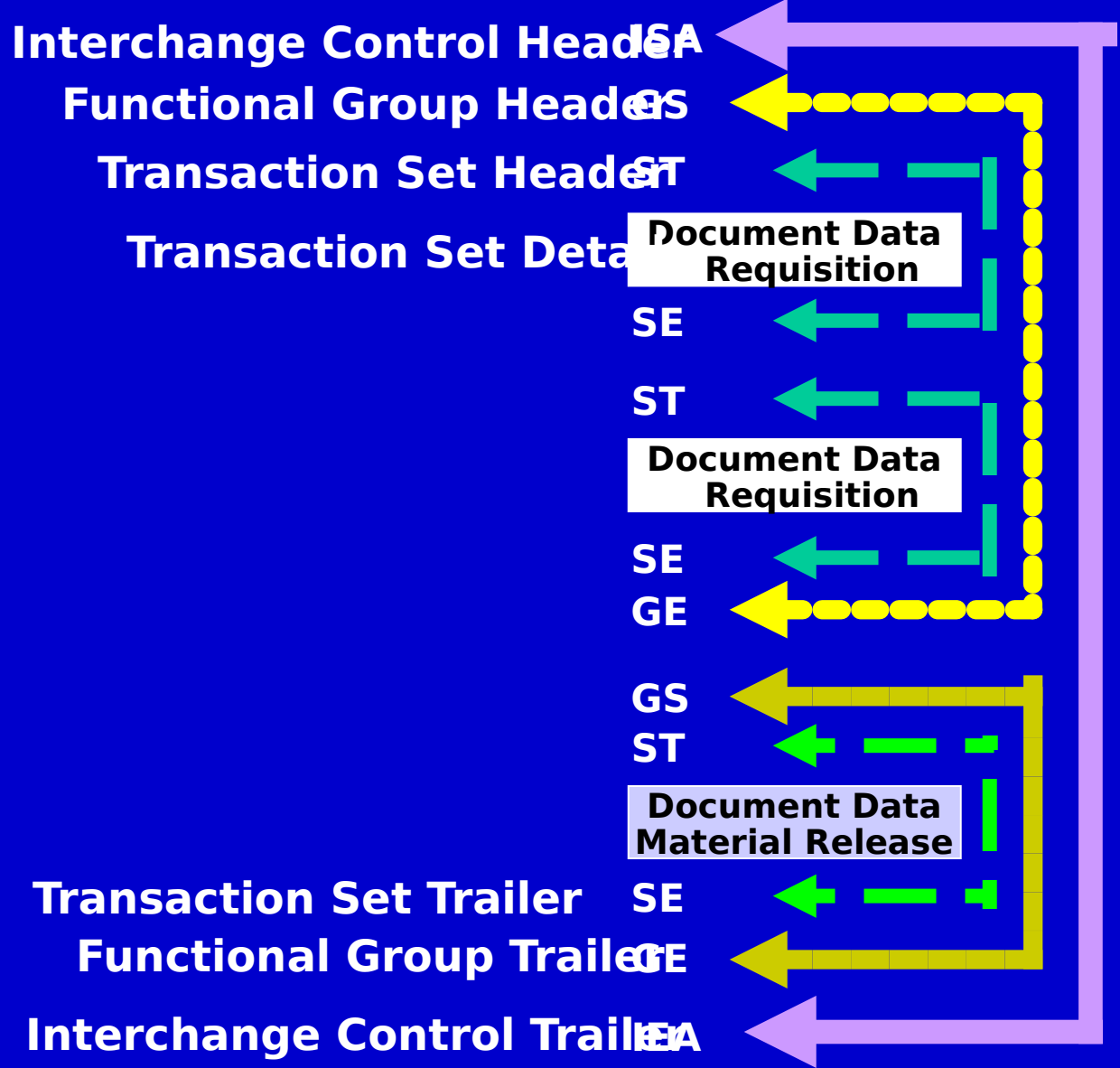
Envelope =
Interchange



=

```
ISA*00*0000000000*01*HAPPYDAYS2*01
*SENDERDUNSNUMBR*01*RECVRDUNSNU
MBER*010110*1653*U*00400*00000030
*0*P*\
  GS...
  ST...
  .
  .
  SE...
  GE...
IEA*1*123456789^
```

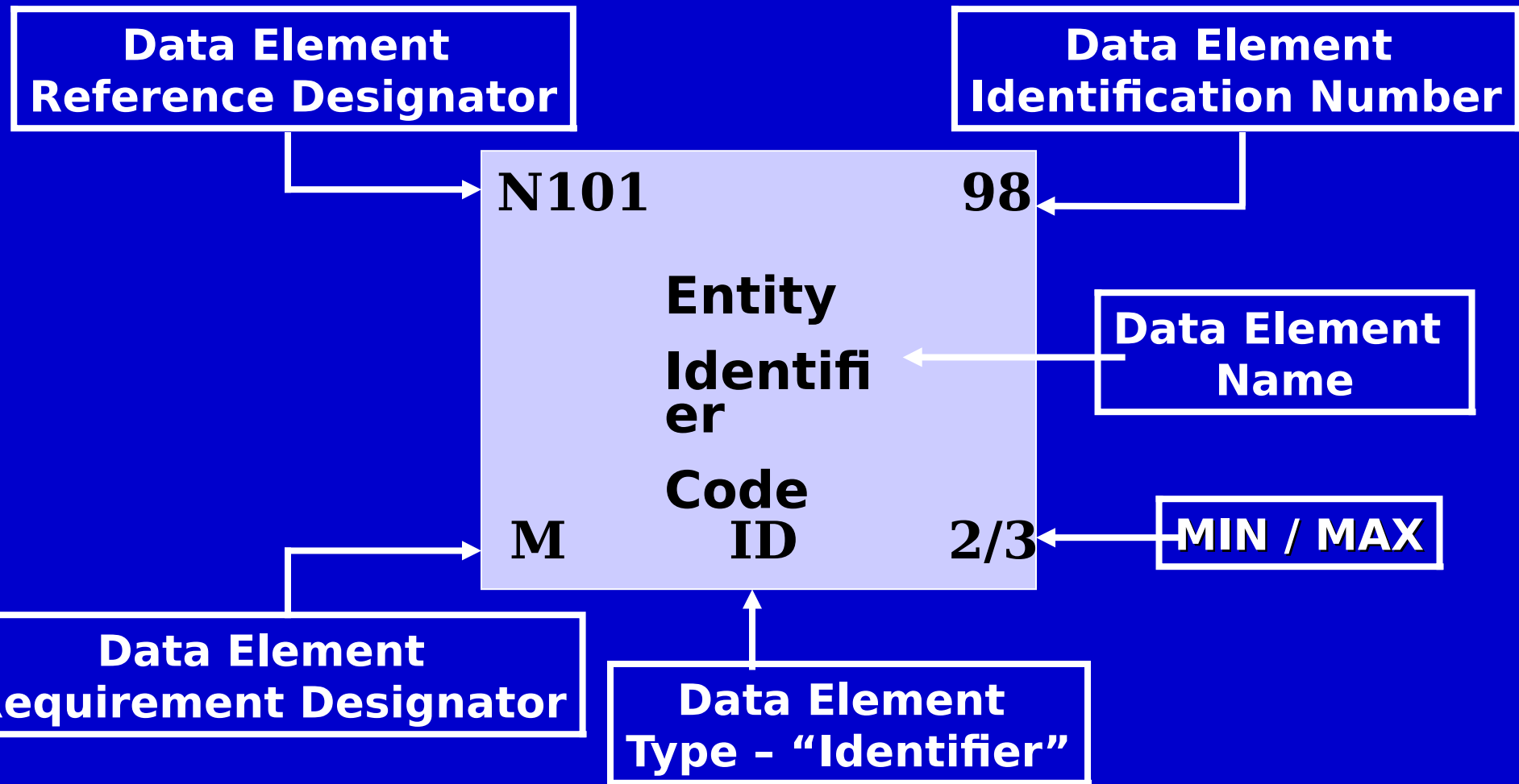

EDI Data Levels



Module 4 Summary

- **What's been covered:**
 - ✓ **The components and structure of EDI**
 - Data Elements
 - Data Segments
 - Segment Loops
 - Transaction Sets
 - Functional Groups
 - Interchange Groups

Data Element within a Data Segment



Transaction Table Diagram

511R Requisition

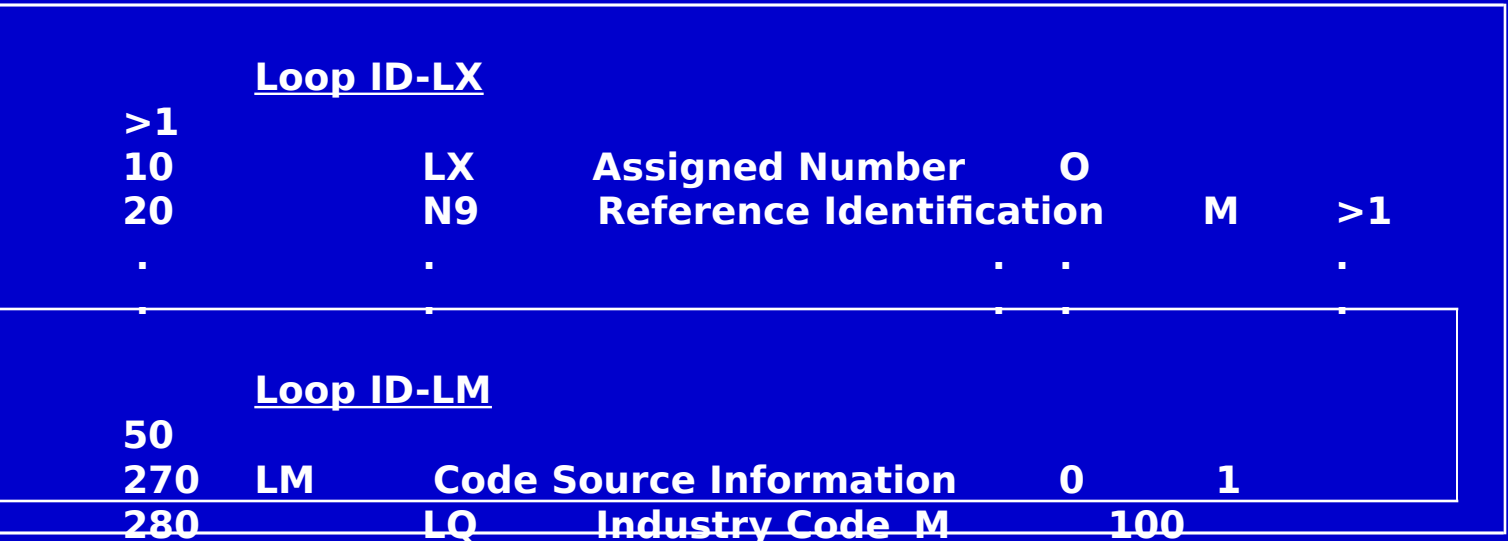
Functional

Group: RN

This Draft Standard for Trial Use contains the format and establishes the data contents of the Requisition Transaction Set (511) for use within the context of an Electronic Data Interchange (EDI) environment.

<u>Req No</u>	<u>Seg ID</u>	<u>Name</u>	<u>Req Des</u>	<u>Max Use</u>	<u>Loop Repeats</u>
010	ST	Transaction Set Header	M	1	
020	BR	Beginning Segment	M	1	
.

Detail:



Quiz

Question 1: Which of the EDI Components is equivalent to a written document?

- a) Interchange groups
- b) A novel
- c) Transaction set

Question 2: The three types of segment level notes are:

- a) Fictional
- b) Syntax
- c) Comments
- d) Semantic

Question 3: Using pages from the X12 511R handout, describe the meaning of the following X12 string of characters:

- a) N1*Z4**M4*DMK**TO^
- b) 2/N103/180
- c) PO1**1*EA***FS*5910001234567^

End of Module 4